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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------|
| APPLICABLE STANDARD                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                       | IEC 61076-3-124                                    |                                                                                                                                                                                                   |                                      |                                                                                           |
| RATING                                                                                                                                                                                                                                                                                                                                                                                                                      | Operating Temperature Range                                                                           | -40°C to +85°C(95%RH max)<br>(note1,2)             | Storage Temperature Range                                                                                                                                                                         | -30°C to +60°C(95%RH max)<br>(note1) |                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                             | Voltage                                                                                               | 50 V AC / 60 V DC                                  | Current                                                                                                                                                                                           | 1.5 A/pin (all pin)                  |                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                       |                                                    |                                                                                                                                                                                                   | 3 A/pin (pin No.1,2,6,7)             |                                                                                           |
| SPECIFICATIONS                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                       |                                                    |                                                                                                                                                                                                   |                                      |                                                                                           |
| ITEM                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                       | TEST METHOD                                        |                                                                                                                                                                                                   | REQUIREMENTS                         | QT AT                                                                                     |
| CONSTRUCTION                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                       |                                                    |                                                                                                                                                                                                   |                                      |                                                                                           |
| General Examination                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                       | Examined visually and with a measuring instrument. |                                                                                                                                                                                                   | According to drawing.                | X X                                                                                       |
| Marking                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                       | Confirmed visually.                                |                                                                                                                                                                                                   | According to drawing.                | X X                                                                                       |
| ELECTRIC CHARACTERISTICS                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                       |                                                    |                                                                                                                                                                                                   |                                      |                                                                                           |
| Contact Resistance                                                                                                                                                                                                                                                                                                                                                                                                          | Measured at 100 mA max (DC or 1000 Hz).                                                               |                                                    | Contact : 30 mΩ max. (note3)<br>Shield : 100 mΩ max. (note3)                                                                                                                                      | X                                    | —                                                                                         |
| Insulation Resistance                                                                                                                                                                                                                                                                                                                                                                                                       | Measured at 500 V DC.                                                                                 |                                                    |                                                                                                                                                                                                   | X                                    | —                                                                                         |
| Voltage Proof                                                                                                                                                                                                                                                                                                                                                                                                               | 500 V DC applied for 1 min. Current leakage 2mA max.                                                  |                                                    | No flashover or breakdown.                                                                                                                                                                        | X                                    | —                                                                                         |
| Insertion Loss                                                                                                                                                                                                                                                                                                                                                                                                              | Measured in the range of 1 to 500 MHz.                                                                |                                                    | 0.02 √(f) dB max.<br>(Whenever the formula results in a value less than 0.1 dB, the requirement shall revert to 0.1 dB.)                                                                          | X                                    | —                                                                                         |
| Return Loss                                                                                                                                                                                                                                                                                                                                                                                                                 | Measured in the range of 1 to 500 MHz.                                                                |                                                    | 68 – 20log(f) dB min.<br>(Whenever the formula results in a value greater than 30 dB, the requirement shall revert to 30 dB.)                                                                     | X                                    | —                                                                                         |
| Near end Crosstalk                                                                                                                                                                                                                                                                                                                                                                                                          | Measured in the range of 1 to 500 MHz.                                                                |                                                    | 94 – 20log(f) dB min. (1MHz to 250MHz)<br>46.04 – 30log(f/250) dB min. (250MHz to 500MHz)<br>(Whenever the formula results in a value greater than 75 dB, the requirement shall revert to 75 dB.) | X                                    | —                                                                                         |
| Far end crosstalk                                                                                                                                                                                                                                                                                                                                                                                                           | Measured in the range of 1 to 500 MHz.                                                                |                                                    | 83.1 – 20log(f) dB min.<br>(Whenever the formula results in a value greater than 75 dB, the requirement shall revert to 75 dB.)                                                                   | X                                    | —                                                                                         |
| Transverse Conversion Loss                                                                                                                                                                                                                                                                                                                                                                                                  | Measured in the range of 1 to 500 MHz.                                                                |                                                    | 68 – 20log(f) dB min.<br>(Whenever the formula results in a value greater than 50 dB, the requirement shall revert to 50 dB.)                                                                     | X                                    | —                                                                                         |
| Transverse Conversion Transfer Loss                                                                                                                                                                                                                                                                                                                                                                                         | Measured in the range of 1 to 500 MHz.                                                                |                                                    | 68 – 20log(f) dB min.<br>(Whenever the formula results in a value greater than 50 dB, the requirement shall revert to 50 dB.)                                                                     | X                                    | —                                                                                         |
| MECHANICAL CHARACTERISTICS                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                       |                                                    |                                                                                                                                                                                                   |                                      |                                                                                           |
| Insertion and Withdrawal Forces                                                                                                                                                                                                                                                                                                                                                                                             | A maximum rate of 50 mm/min.<br>Measured by applicable connector.                                     |                                                    | Insertion force 25 N max.<br>Withdrawal force 25 N max.                                                                                                                                           | X                                    | —                                                                                         |
| Mechanical Operation                                                                                                                                                                                                                                                                                                                                                                                                        | 5000 times insertions and extractions.<br><br>Mating speed : 10 mm/s max.<br>Rest : 5s, min.(unmated) |                                                    | 1) Resistance:<br>Contact : 80 mΩ max. (note3)<br>Shield : 100 mΩ max. (note3)<br>2) No damage, cracks or looseness of parts.                                                                     | X                                    | —                                                                                         |
| <div> <div>  </div> <div> <p>Note</p> <p>1. Non-condensing. 2. The operation temperature includes the temperature rise by current carrying</p> <p>3. The cable conductor resistance is not considered.</p> <p>4. Electrical characteristics are applicable to the contacts and shield except for contacts No. 3 and 6.</p> </div> </div> |                                                                                                       |                                                    |                                                                                                                                                                                                   |                                      |                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                             | COUNT                                                                                                 | DESCRIPTION OF REVISIONS                           | DESIGNED                                                                                                                                                                                          | CHECKED                              | DATE                                                                                      |
|                                                                                                                                                                                                                                                                                                                                          | 18                                                                                                    | DIS-E-00003730                                     | MT.YASUDA                                                                                                                                                                                         | KI.KAGOTANI                          | 20210317                                                                                  |
| REMARK                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                       |                                                    | APPROVED                                                                                                                                                                                          | MN.KENJO                             | 20191209                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                       |                                                    | CHECKED                                                                                                                                                                                           | KI.NAGANUMA                          | 20191209                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                       |                                                    | DESIGNED                                                                                                                                                                                          | MT.YASUDA                            | 20191209                                                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                       |                                                    | DRAWN                                                                                                                                                                                             | YK.MITSUISHI                         | 20191209                                                                                  |
| Unless otherwise specified, refer to IEC 60512.                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                       |                                                    |                                                                                                                                                                                                   |                                      |                                                                                           |
| Note QT:Qualification Test AT:Assurance Test X:Applicable Test                                                                                                                                                                                                                                                                                                                                                              |                                                                                                       |                                                    | DRAWING NO.                                                                                                                                                                                       |                                      | ELC-129980-01-00                                                                          |
|                                                                                                                                                                                                                                                                                                                                          | SPECIFICATION SHEET                                                                                   |                                                    | PART NO.                                                                                                                                                                                          | IX31G-B-10S-CVL1(7.0)(01)            |                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                             | HIROSE ELECTRIC CO., LTD.                                                                             |                                                    | CODE NO.                                                                                                                                                                                          | CL0251-0068-0-01                     |  1/3 |

| SPECIFICATIONS                                                 |                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                              |                           |    |     |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|----|-----|
| ITEM                                                           | TEST METHOD                                                                                                                                                                                  | REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                                 | QT                        | AT |     |
| ⚠<br>Vibration ,sinusoidal                                     | Frequency 10 to 500 Hz<br>0.35 mm, 50 m/s <sup>2</sup><br>2hrs in each of 3 mutually perpendicular axis. ⚠                                                                                   | 1) No electrical discontinuity of 1μs. (note4)<br>2) No damage, cracks or looseness of parts.                                                                                                                                                                                                                                                                                                | X                         | —  |     |
| Fretting Corrosion                                             | 490 m/s <sup>2</sup> , 30 times/min at 1000 times. ⚠                                                                                                                                         | 1) No electrical discontinuity of 1μs. (note4)<br>2) No damage, cracks or looseness of parts.                                                                                                                                                                                                                                                                                                | X                         | —  |     |
| ⚠<br>Mechanical Shock                                          | Subject mated specimens to 300 m/s <sup>2</sup> half-sine shock pulses of 11 milliseconds duration, 3 shocks in both directions of 3 mutually perpendicular directions (totally 18 shocks) ⚠ | 1) No electrical discontinuity of 1μs. (note4)<br>2) Resistance:<br>Contact : 80 mΩ max. (note4)<br>Shield : 100 mΩ max. (note4)<br>3) No damage, cracks or looseness of parts.                                                                                                                                                                                                              | X                         | —  |     |
| ⚠<br>Effectiveness of the connector coupling device            | Applying 80 N force for the mating axis direction in state in fitted with applicable connector.                                                                                              | No unlocking, damage, cracks or looseness of parts.                                                                                                                                                                                                                                                                                                                                          | X                         | —  |     |
| ⚠<br>Locking device mechanical operations                      | 10000 cycles<br>20 cycles/min max                                                                                                                                                            | 1) Insertion and Withdrawal Forces<br>Insertion force 25 N max.<br>Withdrawal force 25 N max.<br>2) No damage, cracks or looseness of parts.                                                                                                                                                                                                                                                 | X                         | —  |     |
| Wrenching Strength                                             | Applying 25times of 30 N 1s for 2 axis direction on tip of plug case in state in fitted with applicable connector.                                                                           | No damage, cracks or looseness of parts.                                                                                                                                                                                                                                                                                                                                                     | X                         | —  |     |
| ENVIRONMENTAL CHARACTERISTICS                                  |                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                              |                           |    |     |
| Rapid Change of Temperature<br>⚠                               | Subject mated specimens to 10 cycles between -55°C and 85°C with 30 minutes dwell at temp. extremes and 2 to 3 minutes transition between temperatures. ⚠                                    | 1) Voltage proof : 500 V DC applied for 1 min.<br>Current leakage 2mA max.<br>No flashover or breakdown.<br>2) Resistance:<br>Contact : 80 mΩ max. (note3)<br>Shield : 100 mΩ max. (note3)<br>3) Insulation resistance: 500 MΩ min. (at dry)<br>4) No damage, cracks or looseness of parts.                                                                                                  | X                         | —  |     |
| Humidity / Temperature Cycling                                 | Low temperature 25 °C;<br>High temperature 65 °C;<br>Cold sub-cycle - 10 °C;<br>Relative humidity 93 %<br>Duration 10 / each 24 h<br>(IEC 60068-2-38,test Z / AD) ⚠                          | 1) Voltage proof : 500 V DC applied for 1 min.<br>Current leakage 2mA max.<br>No flashover or breakdown.<br>2) Resistance:<br>Contact : 80 mΩ max. (note3)<br>Shield : 100 mΩ max. (note3)<br>3) Insulation resistance: 500 MΩ min. (at dry)<br>4) Insertion and Withdrawal Forces<br>Insertion force 25 N max.<br>Withdrawal force 25 N max.<br>5) No damage, cracks or looseness of parts. | X                         | —  |     |
| Damp Heat, Steady State                                        | Subject mated specimens to a relative humidity of 93 % at a temperature of 40°C during 21 days. ⚠                                                                                            | 1) Voltage proof : 500 V DC applied for 1 min.<br>Current leakage 2mA max.<br>No flashover or breakdown.<br>2) Resistance:<br>Contact : 80 mΩ max. (note3)<br>Shield : 100 mΩ max. (note3)<br>3) Insulation resistance: 500 MΩ min. (at dry)<br>4) Insertion and Withdrawal Forces<br>Insertion force 25 N max.<br>Withdrawal force 25 N max.<br>5) No damage, cracks or looseness of parts. | X                         | —  |     |
| Note QT:Qualification Test AT:Assurance Test X:Applicable Test |                                                                                                                                                                                              | DRAWING NO.                                                                                                                                                                                                                                                                                                                                                                                  | ELC-129980-01-00          |    |     |
| <b>HRS</b>                                                     | SPECIFICATION SHEET                                                                                                                                                                          | PART NO.                                                                                                                                                                                                                                                                                                                                                                                     | IX31G-B-10S-CVL1(7.0)(01) |    |     |
|                                                                | HIROSE ELECTRIC CO., LTD.                                                                                                                                                                    | CODE NO                                                                                                                                                                                                                                                                                                                                                                                      | CL0251-0068-0-01          | ⚠  | 2/3 |

| SPECIFICATIONS                                                                      |  |                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                   |  |                           |    |
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| ITEM                                                                                |  | TEST METHOD                                                                                                                                                                                                                                                                                          |  | REQUIREMENTS                                                                                                                                                                                                                                                                                                                                                                                      |  | QT                        | AT |
| ENVIRONMENTAL CHARACTERISTICS                                                       |  |                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                   |  |                           |    |
| Dry Heat                                                                            |  | Subject to +85 ± 2 °C, 21 days.<br>(mating applicable connector)                                                                                                                                                                                                                                     |  | ⚠<br>1) Voltage proof : 500 V DC applied for 1 min.<br>Current leakage 2mA max.<br>No flashover or breakdown.<br>2) Resistance:<br>Contact : 80 mΩ max. (note3)<br>Shield : 100 mΩ max. (note3)<br>3) Insulation resistance: 500 MΩ min. (at dry)<br>4) Insertion and Withdrawal Forces<br>Insertion force 25 N max.<br>Withdrawal force 25 N max.<br>5) No damage, cracks or looseness of parts. |  | X                         | —  |
| Cold                                                                                |  | Subject to -55 ± 3 °C, 10 days.<br>(mating applicable connector)                                                                                                                                                                                                                                     |  | ⚠<br>1) Voltage proof : 500 V DC applied for 1 min.<br>Current leakage 2mA max.<br>No flashover or breakdown.<br>2) Resistance:<br>Contact : 80 mΩ max. (note3)<br>Shield : 100 mΩ max. (note3)<br>3) Insulation resistance: 500 MΩ min. (at dry)<br>4) Insertion and Withdrawal Forces<br>Insertion force 25 N max.<br>Withdrawal force 25 N max.<br>5) No damage, cracks or looseness of parts. |  | X                         | —  |
| Corrosion Salt Mist                                                                 |  | Subject to 5 % salt water, 35 ± 2 °C, 48h.<br>(leave under unmated condition.)                                                                                                                                                                                                                       |  | No heavy corrosion of contacts.                                                                                                                                                                                                                                                                                                                                                                   |  | X                         | —  |
| Mixed Flowing Gas Corrosion                                                         |  | Test temperature : +25±1 °C, Relative humidity : 75±3 %<br>H <sub>2</sub> S : 10±5 ppb, NO <sub>2</sub> : 200±50 ppb<br>Cl <sub>2</sub> : 10±5 ppb, SO <sub>2</sub> : 200±20 ppb<br>Leave the samples for 4 days with mated.<br>The same is performed with unmated samples.<br>(IEC 60512, method 4) |  | ⚠<br>1) Resistance:<br>Contact : 80 mΩ max. (note3)<br>Shield : 100 mΩ max. (note3)<br>2) No damage, cracks or looseness of parts.                                                                                                                                                                                                                                                                |  | X                         | —  |
|                                                                                     |  |                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                                                                                                                                                                                                                                                                   |  |                           |    |
| Note QT:Qualification Test AT:Assurance Test X:Applicable Test                      |  |                                                                                                                                                                                                                                                                                                      |  | DRAWING NO.                                                                                                                                                                                                                                                                                                                                                                                       |  | ELC-129980-01-00          |    |
|  |  | SPECIFICATION SHEET                                                                                                                                                                                                                                                                                  |  | PART NO.                                                                                                                                                                                                                                                                                                                                                                                          |  | IX31G-B-10S-CVL1(7.0)(01) |    |
|                                                                                     |  | HIROSE ELECTRIC CO., LTD.                                                                                                                                                                                                                                                                            |  | CODE NO                                                                                                                                                                                                                                                                                                                                                                                           |  | CL0251-0068-0-01 ⚠ 3/3    |    |